

Proving the Dangers of High Fructose Corn Syrup Versus Cane Sugar – Mucosal Adhesion of Fructose Globules Prompt Hormone Production

3 April 2025

Simon Edwards

Research Acceleration Initiative

Introduction

Although there is widespread public consensus that High Fructose Corn Syrup is less healthy than is natural cane sugar, lobbying by the soft-drink industry has prevented substantive research into this area. The industry points to the fructose in HFCS as being chemically identical as proof that it could not possibly be more harmful than the fructose in cane sugar. The purpose of this publication is to inform the scientific community of the precise reason why HFCS is more dangerous so that the hypothesis may be rapidly confirmed so as to create a scientific and, ultimately, therefore, a legal basis upon which the use of HFCS as a food ingredient may be prohibited.

Abstract

When cane sugar is dissolved in water, it dissolves more completely and does not consist of globules within the dissolved solution. HFCS, by contrast, because is a syrup, does not completely dissolve in a fluid solution the way a solid would. HFCS forms tangled, long-chain molecules in the form of globules. The structure of these globules causes them to have an adhesive quality which cane sugar lacks. This is extremely significant in terms of how the body reacts to the substance.

When a person ingests a soft-drink sweetened with HFCS, globules of HFCS adhere to the stomach lining (mucosa) over an extended period of time. The adhesion of the molecules results in the triggering of a hormonal signalling process in which the mucosa produces signals which make their way to the nearby pancreas, instructing the pancreas to produce more insulin.

Ordinarily, sugar would have to be ingested and absorbed through the small intestine before the pancreas could meaningfully react. There is, however, an early-warning system in the form of hormonal signalling between the mucosa and the pancreas. This allows for insulin production to begin *prior to* the time when blood sugar could be expected to begin rising due to absorption.

This signalling mechanism is meant only to prime the pancreas. This mechanism is not intended to be kept active for more than about 10 minutes. So long as the HFCS remains adhered to the mucosa, the mucosa will continue to produce the signals and the pancreas will over-produce insulin. The result is that a person who consumes HFCS-sweetened drinks may experience *decreased* blood-sugar if the drink is not taken with food, resulting in the rarely diagnosed condition called non-diabetic hypoglycemia. This is counter-intuitive, but easy to understand when one takes into account the adhesive qualities of HFCS. When taken with food, not only is a source of complex carbohydrates introduced, thereby preventing dips in blood sugar, but the food can absorb much of the HFCS, preventing adhesion and preventing acute hypoglycemia in those cases. Much more common, however,

is for a person consuming HFCS-sweetened drinks to over-consume food products. Because insulin is over-produced early in the digestive process, it is under-produced in the latter part of that process, resulting in weight gain and "insulin resistance."

In the case of an individual consuming too much HFCS *and* overeating, the excessive production of hormones which prime the pancreas to produce insulin results in a different kind of hormonal resistance i.e. the tendency of the pancreas to stop responding to the hormonal signals produced by the mucosa. If a person eats too much in the aftermath of having consumed an HFCS-sweetened beverage, they may not produce sufficient insulin in order to keep blood sugar within a healthy range, ultimately leading to damage to the pancreas and an inability to cope with their own metabolic needs.

Conclusion

Sugar's harmful effects are not only related to sugar's absorption into the bloodstream, but begin with sugar's influence on the endocrine system upon contact with the mucosa. The structure of fructose globules in HFCS dramatically affects the overall health consequences of consumption of the compounds, as do other factors such as whether the substance is consumed along with too much or too little food. Something as simple as drinking water immediately after consuming an HFCS-sweetened beverage could help to mitigate the harmful effects associated with mucosal adhesion, however, the optimal solution would be to abolish the use of HFCS entirely.

One test of this hypothesis would be to identify a person with diagnosed non-diabetic hypoglycemia and to attempt to provoke an acute spell by providing them with an HFCS-sweetened beverage on an empty stomach. The next day, the person could be given a cane-sugar sweetened beverage on an empty stomach and the dip in blood sugar could be compared. This author predicts with a high degree of confidence than the NDH patient consuming the HFCS-sweetened beverage will experience a more severe crash in blood-sugar approximately 20-30 minutes after consumption than they would with a cane sugar-sweetened beverage.